NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date:

Region: Wilmington Regional Office
County: Columbus
NC Facility ID: 2400093
Inspector's Name: Mark Hedrick
Date of Last Inspection: 06/24/2015
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Hexion Inc. - Acme Operations

Facility Address:
Hexion Inc. - Acme Operations
333 Neils Eddy Road
Riegelwood, NC 28456

SIC: 2869 / Industrial Organic Chemicals,nec
NAICS: 325199 / All Other Basic Organic Chemical Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: N/A
NSPS: N/A
NESHAP: Alternative monitoring under HON
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): Yes
Other: Removal of NC Air Toxics

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Tom Buller Regional EHS Manager (910) 274-5921 333 Neils Eddy Road Riegelwood, NC 28456	Ronald Bazinet Site Leader (910) 655-2263 333 Neils Eddy Road Riegelwood, NC 28456	Tom Buller Regional EHS Manager (910) 274-5921 333 Neils Eddy Road Riegelwood, NC 28456

Application Data

Application Number: 2400093.14A
Date Received: 06/04/2014
Application Type: Modification
Application Schedule: TV-Significant

Existing Permit Data
Existing Permit Number: 01394/T45
Existing Permit Issue Date: 02/04/2015
Existing Permit Expiration Date: 05/31/2017

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2013	0.0200	21.69	35.95	2.29	2.23	27.78	26.18 [Methanol (methyl alcohol)]
2012	0.0300	23.25	40.35	3.62	2.56	30.46	29.41 [Methanol (methyl alcohol)]
2011	0.0200	21.13	39.85	3.35	2.40	30.37	29.05 [Methanol (methyl alcohol)]
2010	47.12	25.90	37.77	1.45	5.99	29.13	26.35 [Methanol (methyl alcohol)]
2009	65.76	24.90	33.74	1.64	6.54	27.08	24.02 [Methanol (methyl alcohol)]

Review Engineer: Betty Gatano

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 01394/T46
Permit Issue Date:
Permit Expiration Date:

1. Purpose of Application

Hexion Inc. – Acme Operations (Acme) currently holds Title V Permit No. 01394T45 with an expiration date of May 31, 2017 for a chemical manufacturing facility in Riegelwood, Columbus County, North Carolina. A permit application for a Title V significant modification was received on June 4, 2014. In the permit application, the facility requests alternative monitoring under 40 CFR 63 Subpart G for catalytic oxidizer (ID No. CD-002-01a). The facility also requests to remove the permitted toxic air pollution limits for emission sources subject to a Maximum Achievable Control Technology (MACT) standard.

2. Facility Description

Acme is a chemical manufacturing facility that produces formaldehyde, resin, hexamethylene-tetramine (hexamine), and various specialty chemicals. The processes at the plant are divided into three distinct chemical manufacturing process units (CMPUs):

- Formaldehyde CMPU – Converts methanol into formaldehyde through a catalytic oxidation process. The CMPU includes three reactors and four adsorption columns for recovering the product. This CMPU is subject to the "NESHAP from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater," 40 CFR 63 Subpart G, also referred to as the "Hazardous Organic NESHAP" or HON.

- Special Project CMPU – Various products, including ketone resins, can be manufactured in this process area using batch reactors. This CMPU is subject to the "NESHAP for Miscellaneous Organic Chemical Manufacturing, 40 CFR 63 Subpart FFFF, also referred to the "Miscellaneous Organic NESHAP" or MON.

- Hexamine CMPU – Hexamine is formed by reacting formaldehyde and ammonia. The CMPU includes a reactor, evaporator, crystallizers, and a centrifuge. Acme can sell the hexamine in slurry form or can dry the product through a centrifugal process. This CMPU is also subject to the HON.

The plant also includes raw material handling and storage operations, utility operations (including steam production and wastewater treatment), and finished product loadout activities. As a chemical manufacturing facility, the existing major source threshold for the facility under the Prevention of Significant Deviation (PSD) permitting program provided in 2D .0530 is 100 tons per year (tpy). The facility has an enforceable limit on sulfur dioxide (SO_2) emissions, which enables it to be classified as an existing minor PSD source. Potential emissions of all other PSD-regulated pollutants, including greenhouse gases, are less than the PSD major source thresholds. Acme is a Title V facility because potential hazardous air pollutants (HAP) emissions are greater than 10 tpy of individual HAPs and 25 tpy of total HAPs.

3. Application Chronology

June 4, 2014	A permit application for a TV signification modification (also called a "one step significant modification") was received.

June 6, 2014	Sent acknowledgment letter indicating the application for significant modification was complete.
August 5, 2014	Source test review letter issued. The letter indicated the source testing conducted in January 2014 at Acme showed compliance with the HON.
October 30, 2014	Air dispersion modeling review letter issued. The modeling indicated the increased formaldehyde emissions will not exceed the acceptable ambient level (AAL).
June 29, 2015	Permit application re-assigned to Betty Gatano.
August 5, 2015	Draft permit and permit review forwarded for comments.
August 6, 2015	Comments received from Mark Cuilla, Permitting Supervisor.
October 7, 2015	Received comments from Taylor Loftis, consultant for the acme. In his comments, Mr. Loftis specified certain tanks were subject to the NESHAP from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater," (aka HON) 40 CFR 63 Subpart G. He requested these tanks be removed from NC Air Toxics requirements as a result.
October 8, 2015	Betty Gatano e-mailed Taylor Loftis and requested justification for the HON status of these tanks.
November 6, 2015	After research, Taylor Loftis provided justification as requested via e-mail.
November 25, 2015	Betty Gatano e-mailed Taylor Loftis regarding applicability of additional emission sources.
December 3, 2015	Response from Taylor Loftis received via e-mail.
December 10, 2015	Taylor Loftis and Betty Gatano discussed applicability of additional emission sources at the facility, during a follow-up phone call. During the discussion, Mr. Loftis also indicated the facility does not want to remove cooling tower No. 3 (ID no. ES-003-03) from the permit, as indicated in the permit application. Acme intends to construct a backup cooling tower, and cooling tower No. 3 will be removed from the permit when the backup cooling tower is added.
December 11, 2015	Revised permit and permit review forwarded for review and comments.
January 7, 2016	Taylor Loftis indicated in a phone conversation with Betty Gatano that the draft permit was acceptable.
January 8, 2016	Permit and permit review forwarded to public notice.

4. Permit Modifications/Changes and TVEE Discussion

The following table describes the changes to the current permit under this permit modification.

Pages	Section	Description of Changes
Cover and throughout	-	Updated all dates and permit revision numbers.
--	Insignificant Activities	• Removed the methanol drum loading operation (ID No. IMDL). • Removed the solids feed system to hexamine tanks #3 and #4 (ID No. ISF). • Removed the 30,000 gallon Propane Tank (ID No. IT3). • Modified the contents of tank (ID No. IT14). It now stores washing solution. • Removed 50 gallon the recovac tank (ID No. IT46). • Moved tanks (ID Nos. IES-T2 through IES-T6 and IES-T52) to the insignificant activities list, renamed them, and labeled them as "MACT G, ww2" sources. • Moved resin and distillate wastewater feed tanks (ID Nos. IES-IT6, IES-T44, and IES-T45) to the insignificant activities list, renamed them, and labeled them as "MACT FFFF, ww2" sources.
3 – 6	1.0 Equipment List	• Removed the product recovery adsorption columns (ID Nos. ES-002-01.5 and ES-002-01.7). • Removed the formaldehyde drum filing process (ID No. ES-002-03). • Corrected the capacity of the hexamine hold tank, surge tank, and feed tank. • Removed asterisks and footnote for minor modification for emission sources (ID Nos. S4, S5, and ES-004-T12) • Identified tanks (ID Nos. ES-001-02.8-5 and ES-001-02.8-6) as subject MACT Subpart H. • Moved tanks (ID Nos. ES-T2 through ES-T6 and ES-T52) to the insignificant activities list and renamed them. These tanks were included on the permit because they were subject to NC Air Toxics. Under this modification, they were identified as subject to a MACT and are exempt from NC Air Toxics, per 15A NCAC 2Q .0702(a)(27). • Moved resin and distillate wastewater feed tanks (ID Nos. ES-IT6, ES-T44, and ES-T45 to the insignificant activities list and renamed them. These tanks were included on the permit because they were subject to NC Air Toxics. Under this modification, they were identified as subject to a MACT and are exempt from NC Air Toxics, per 15A NCAC 2Q .0702(a)(27). • Added MACT labels for emission sources (ID Nos. ES-002-Fug01, ES-001-Fug03, ES-007.1, ES-007.2, ES-007.3, ES-007.5, and ES-007.6).
7	2.1.A – Regulations Table	Removed reference to 15A NCAC 2D .1100. The boiler (ID No. ES-001-01) is subject to the Case-by-Case MACT and is exempt from air toxics per 15A NCAC 2Q .0702(a)(27).
9	2.1.A.4.b	Corrected dates to indicate the boilers will be subject to the "NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters," 40 CFR Part 63, Subpart DDDDD beginning May 20, 2019.

Pages	Section	Description of Changes
11	2.1.B – Regulations Table	Removed reference to 15A NCAC 2D .1100. The formaldehyde process is subject to the "NESHAP from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater," (aka HON) 40 CFR 63 Subpart G, and is exempt from air toxics per 15A NCAC 2Q .0702(a)(27).
11 – 13	2.1.B.1.	• Revised permit condition for the HON to allow for alternative monitoring of the electrically-heated catalytic oxidizer (ID No. CD-002-01a). • Removed references to bypassing the oxidizer. The unit does not have a diversion stack or bypass valve.
15	2.1.D – Regulations Table	Removed reference to 15A NCAC 2D .1100. The formaldehyde storage tanks are subject to the HON and are exempt from air toxics per 15A NCAC 2Q .0702(a)(27).
16	2.1.E – Regulations Table	Removed reference to 15A NCAC 2D .1100. The formaldehyde transfer rack is subject to the HON and is exempt from air toxics per 15A NCAC 2Q .0702(a)(27).
16	2.1.F	Removed formaldehyde drum filling (ID No. ES-002-03) from permit. This condition will be listed as reserved to prevent renumber the remainder of the permit.
16	2.1.G – Regulations Table	Removed reference to 15A NCAC 2D .1100. The special projects process is subject to the "NESHAP for Miscellaneous Organic Chemical Manufacturing," 40 CFR 63 Subpart FFF, and is exempt from air toxics per 15A NCAC 2Q .0702(a)(27).
21	2.1.H – Equipment List	Rearranged the list of emission sources to clarify that tanks (ID Nos. ES-001-002.8-5 and ES-001-002.8-6) are not controlled by the catalytic oxidizer (ID No. CD-001-02b).
21	2.1.H – Regulations Table	Specified that only emissions sources (ID Nos. ES-001-02.1 through ES-001-02.8-4) are subject to 40 CFR 63 Subpart G.
22	2.1.H.1	Clarified the emissions sources (ID Nos. ES-001-02.1 through ES-001-02.8-4) are subject to 40 CFR 63 Subpart G.
28	2.1.I.1 – Equipment List	Updated the list of tanks.
28	2.1.I – Regulations Table	Added reference to the HON for emission sources (ID Nos. ES-007.1, ES-007.2, ES-007.3, ES-007.5, and ES-007.6).
29	2.1.I.3	Added permit condition for 40 CFR Part 63, Subpart G, Group 2 Wastewater Requirements for emission sources (ID Nos. ES-007.1, ES-007.2, ES-007.3, ES-007.5, and ES-007.6).
35	2.2.A – Regulations Table	Added reference to surge control vessels (ID Nos. ES-001-002.8-5 and ES-001-002.8-6).
43	2.2.B.3	Revised the permit condition for15A NCAC 2D .1100 to remove reference to all emission sources subject to a MACT. Such sources are exempt from air toxics per 15A NCAC 2Q .0702(a)(27).
44 – 52	3.0	Updated the General Conditions and the List of Acronyms to the most current version (V4.0: 12/17/2015).

The following changes to Title V Equipment Editor (TVEE) are needed under this permit modification.

- Removed the methanol drum loading operation (ID No. IMDL).
- Removed the solids feed system to hexamine tanks #3 and #4 (ID No. ISF).
- Removed the 30,000 gallon Propane Tank (ID No. IT3).
- Modified the contents of tank (ID No. IT14). It now stores washing solution.

- Removed 50 gallon the recovac tank (ID No. IT46).
- Removed the product recovery adsorption columns (ID Nos. ES-002-01.5 and ES-002-01.7).
- Removed the formaldehyde drum filing process (ID No. ES-002-03).
- Corrected the capacity of the hexamine hold tank, surge tank, and feed tank.
- Removed asterisks and footnote for minor modification for emission sources (ID Nos. S4, S5, and ES-004-T12).
- Moved tanks (ID Nos. IES-T2 through IES-T6 and IES-T52) to the insignificant activities list.
- Moved resin and distillate wastewater feed tanks (ID Nos. IES-IT6, IES-T44, and IES-T45) to the insignificant activities list.
- Added MACT labels to numerous emission sources.

5. Alternative Monitoring under the HON

The formaldehyde production process (ID Nos. ES-002-01.1 through ES-002-01.8) converts methanol into formaldehyde through catalytic oxidation. The CMPU includes three reactors, four adsorption columns for recovering the product, and two methanol storage tanks all controlled by an electrically-heated catalytic oxidizer (ID No. CD-002-01a). This CMPU is subject to the HON and Acme must reduce HAP emissions by 98% or to an exhaust concentration of 20 ppm from Group 1 process vents, per 40 CFR 63.113. Facilities using a catalytic oxidizer to achieve compliance with the emission limit must conduct a compliance test to establish a temperature rise across the catalyst bed that ensures the emission limit is met. Facilities must also continuously monitor temperatures at the inlet and outlet of the oxidizer. Previous testing at the facility measured the inlet and outlet temperature of the oxidizer to establish a 250^{o}C temperature rise across the catalytic oxidizer, which must be maintained as required in the current permit.

In the permit application, Acme contends monitoring temperature rise across the catalyst bed is not an appropriate method for demonstrating the effective operation of the catalyst. The temperature rise across the catalyst bed is a direct function of the heat input (i.e., flow rate and heating value) of the vent gas. Although the formaldehyde production process is continuous, emissions from the process are not continuous at the maximum rate. The inlet VOC loading and heat value, and resulting heat input, can fluctuate based on the process rate. For instance, if the heating value of the vent gas drops more than a few percent due to a decrease in production rate, even complete destruction of all organic HAPs may not generate enough temperature rise across the bed equivalent to the temperature differential measured during the initial compliance testing.

Acme is requesting to use alternative monitoring to ensure compliance with the HON emission limits. The provisions of Subpart G of the HON in 40 CFR 63.151(g)(5) provide opportunity to present alternate continuous monitoring pursuant to Subpart A [40 CFR 63.8(f)(5)(i)], and the DAQ concurs the permit application meets the provisions. The DAQ has been delegated the authority to approve alternative monitoring under this MACT and agrees the proposed changes are acceptable. The justification for this decision is found in the March 21, 2007 letter to Hexion Specialty Chemicals, Inc., in Fayetteville, NC, which states the following:

> *It is clear from every MACT standard promulgated after the turn of the century that EPA accepts annual catalyst activity checks in lieu of temperature rise across the bed as proven technology. As the national precedence has been effectively established by the more current standards, it is our belief that the same option should be afforded to the Subpart G affected facilities. Furthermore, it*

is apparently an option for the facility to choose freely without having to prove its necessity, as in all other promulgated MACT standards. The DAQ is of the opinion that a properly developed and implemented maintenance plan should be made available as a monitoring option for all Subpart G affected facilities.[1]

The facility is proposing to monitor the temperature at the inlet of the catalytic oxidizer continuously and test and verify the activity level of the catalyst annually to ensure compliance with the HON emission limits. The facility proposes the following:

- Monitor the temperature immediately upstream of the catalyst bed continuously.
- Set the minimum upstream temperature to 505°F.
- Compile daily average temperatures upstream of the catalytic oxidizer (ID No. CD-002-01A).
- Conduct an annual activity check on the catalyst.
- Maintain records of any actions on the catalytic oxidizer.

The minimum inlet temperature was determined during compliance testing for the HON performed on January 23, 2014 at the Acme facility. The results were reviewed and approved by Shannon Vogel of the DAQ, as indicated in a memorandum dated August 5, 2014. The test results demonstrated a 98.7% destruction efficiency of formaldehyde and a 99.5% destruction efficiency of methanol. The inlet temperature to the catalytic oxidizer across all three runs during testing is shown in the table below, and the minimum temperature at the inlet of the catalytic oxidizer will be set at 505°F based on the testing.

Parameter	Run. 1	Run. 2	Run. 3	Average
Catalytic Oxidizer Inlet Temperature (°F)	513	514	506	511

The proposed alternative monitoring and associated recordkeeping and reporting will be added to the permit under this modification. The revised permit condition is found in Attachment 1.

6. Air Toxics Evaluation

Acme has accepted permit limits for ammonia and formaldehyde to ensure compliance with the NC air toxics regulations under 2D .1100. The permitted emission limit of formaldehyde from the formaldehyde production process and methanol tanks routed to the catalytic oxidizer (ID No. CD-002-01A) is 0.006 lb/hr. This emission rate was based on a source test conducted in 1998. Compliance with the AAL was demonstrated in air modeling conducted in September 2013, and revised formaldehyde limits were incorporated into Air Permit No. 01394T44 issued on November 15, 2013.

The emission rate of formaldehyde measured during source testing in January 2014 was 0.228 pounds per hour from the outlet of the oxidizer, which exceeded the permitted limit. Acme conducted a revised facility-wide modeling as part of this permit application demonstrating the increased emissions of formaldehyde do not exceed the AAL. The air dispersion modeling was reviewed and approved by Steve Lund DAQ Air Quality Analysis Branch (AQAB), as described in a

[1] Donald van der Vaart, NCDAQ; letter to Craig Pryzgoda, Hexion Specialty Chemicals; March 21, 2007.

memorandum dated October 30, 2014. The results of the modeling using the increased emission rate showed the maximum impact for formaldehyde was 76% of the AAL.

Acme has also requested the modeled emission limits for formaldehyde and ammonia under 2D .1100 for emission sources subject to a MACT be removed from the permit, per the exemption under 2Q .0702(a)(27). The facility demonstrated via its revised air modeling increased emissions of formaldehyde do not exceed the AAL, and thus, the formaldehyde limits can be removed for MACT sources. The DAQ conducted a facility-wide evaluation for ammonia as part of this permit modification to ensure removal of the emission limits would not present "an unacceptable risk to human health," in accordance with G.S. 143-215. 107(b) as codified on May 1, 2014. The DAQ compared the highest actual emissions of ammonia over the past five years with modeled emission limit, as shown in the table below. The boiler (ID No. ES-001-01) and the hexamine process (ID No. ES-001-02) were the only sources considered in the evaluation because they were the only sources subject to a MACT that emitted ammonia. In both cases, actual emissions of ammonia were below the permitted limits, and removing emission limits of ammonia for the MACT sources does not "present an unacceptable risk to human health."

Emission Sources	**Actual Emissions of Ammonia (lb/yr)**					**Highest Emission Rate (lb/hr)**	**Permitted Limit (lb/hr)**
	2009	**2010**	**2011**	**2012**	**2013**		
Boiler (ID No. ES-001-01)	--	--	--	**274.4**	174.6	0.031	0.14
Hexamine Production Process controlled by catalytic oxidizer (ID No. CD-001-02b)	47.9	59.6	59.2	**65.1**	65.1	0.0075	0.01
Notes: The facility was assumed to operate 8736 hours per year as reported in emission inventory. Actual emissions are from the DAQ emission inventory.							

The TV permit includes modeled emission limits under 2D .1100 for arsenic, beryllium, chromium VI equivalents, and nickel from the boilers (ID Nos. ES-001-01 and ES-001-01T). The DAQ received an updated compliance demonstration for these TAPs on December 28, 2011. The air dispersion modeling was reviewed and approved by Jerry Freeman of the AQAB, as described in a memorandum dated January 9, 2012. These limits were added to the permit under Air Permit No. 01394T43 issued on June 5, 2012.

The DAQ conducted a facility-wide evaluation for these metals as part of this permit modification to ensure removal of the emission limits would not present "an unacceptable risk to human health," in accordance with G.S. 143-215. 107(b) as codified on May 1, 2014. The DAQ compared the highest actual emissions of these metals over the past five years with the modeled emission limits. As shown in the table below, actual emissions were below the permitted limits, and removing emission limits on the boiler (ID No. ES-001-01) for these TAPs does not "present an unacceptable risk to human health." It should be noted the limits will be removed only for boiler (ID No. ES-001-01). The limits cannot be removed for the temporary boiler (ID No. ES-001-01T), because it is not subject to a MACT.[2]

[2] Acme has accepted an avoidance condition for the Case-by-Case MACT for the natural gas/No. 2/ No. 5/ No. 6 fuel oil-fired back-up boiler (ID No. ES-001-01T).

TAP	Actual Emissions (lb/yr)					Highest Emission Rate	Permitted Limit
	2009	2010	2011	2012	2013		
Arsenic	0.53	0.38	0.02	0.01	0.01	0.53 lb/yr	0.80 lb/yr
Beryllium	0.01	0.02	0	0	0.0007	0.02 lb/yr	0.28 lb/yr
Chromium	0.1	0.07	0	0	0	0.00028 lb/day	.000413 lb/day
Nickel	33.71	23.87	0.16	0.18	0.11	0.093 lb/day	0.32 lb/day
Notes: The facility was assumed to operate 8736 hours per year as reported in emission inventory. Actual emissions are from the DAQ emission inventory.							

The emission limits for all MACT sources will be removed from the permit condition for 2D .1100 as part of this permit modification. The revised permit condition is provided in Attachment 2.

7. NSPS, NESHAPS/MACT, NSR/PSD, 112(r), CAM

NSPS

The natural gas/No. 2/ No. 5/ No. 6 fuel oil-fired back-up boiler (ID No. ES-001-01T: less than 30 million Btu per hour) is subject to the "NSPS for Small Industrial, Commercial, Institutional Steam Generating Units," 40 CFR Part 60 Subpart Dc. This subpart applies to boilers constructed, modified, or reconstructed after June 9, 1989 and have a maximum design heat input capacity > 10 million Btu per hour and < 100 million Btu per hour.

The requirements for boilers subject to NSPS Subpart Dc vary based on the size of the boiler and fuel type fired. The boiler does not fire on wood or coal and, thus, is not subject to the particulate matter standards under this rule. Also, the boiler is less than 30 million Btu hour and does not have any visible emission requirements under NSPS Subpart Dc. The boiler is subject to the sulfur dioxide emission limits as discussed below:

- Sulfur Dioxide: The maximum sulfur content of any fuel oil received and fired in the boiler shall not exceed 0.5 percent by weight. To demonstrate compliance with this standard, Acme is required to retain copies of each fuel supplier certification, including the sulfur content of the oil (in percent by weight). The facility is also required to submit a semiannual report summarizing the monitoring activities (January 30th and July 30th).

The facility is also required to record the total quantity of fuel fired in the boiler each month. No other requirements apply under NSPS Subpart Dc when firing natural gas.

This permit modification does not affect NSPS Subpart Dc requirements, and no changes to the permit are needed.

MACT/GACT

Acme is subject to the following MACTs.

MACT Subparts F, G, and H (aka the HON)

The formaldehyde CMPU and parts of the hexamine CMPU are subject to the HON. As specified in 40 CFR Part 63.100(b), the provisions of Subparts F, G, and H (aka the HON) apply to chemical manufacturing units that meet the criteria specified in 63.100(b)(1) through (3).

Acme meets these criteria, as shown below:

- The CMPUs manufacture as a primary product a compound listed in Table 1 of 40 CFR 63 Subpart F (formaldehyde and hexamine).
- The CMPUs use a HAP listed in Table 2 of 40 CFR 63 Subpart F as a reactant (methanol and formaldehyde).
- Acme is a major source of HAPs.

For a thorough overview of the requirements under the HON, please refer to the permit review for the initial Title V Permit issued to the facility (then Wright Chemical Corporation) on December 18, 2003.[3]

As discussed in Section 5 above, the permit is being modified to allow for alternative monitoring of the electrically-heated catalytic oxidizer (ID No. CD-002-01a) on the formaldehyde CMPU as allowed by the HON. No other changes are required for emission sources subject to the HON under this permit modification.

Also under this permit modification, Acme has requested to designate HON applicable tanks as Group 2 emission sources. The emission sources and the justification for their Group 2 status are provided below:

- Environmental Intermediate Tanks (ID Nos. ES-007.5 and ES-007.6) and Environmental Regeneration Tanks (ID Nos. ES-007.1, ES-007.2, and ES-007.3) - Tanks ES-007.5 and 7.6 contain hexamine wastewater, which is called intermediate water at the plant. It is generated in the hexamine process and contains residual ammonia. Some of the wastewater is recycled to the process. The remaining wastewater is sent to tanks ES-007.1 through ES-007.3, where wastewater is then shipped off-site as waste. The liquid in the tanks meets the definition of process wastewater in 40 CFR 63.101 but does not meet the definition of Group 1 wastewater stream under 40 CFR 63.111. Any process wastewater stream that does not meet the definition of a Group 1 wastewater stream is defined as a Group 2 wastewater stream. Per 40 CFR 63.132(a)(3), the facility must comply with the applicable recordkeeping and reporting requirements specified in 40 CFR 63.146(b)(1) and 63.147(b)(8) for its Group 2 wastewater streams.

- Blend Hexamine Tanks (ID Nos. ES-T2 through ES-T6) and the Liquid Hexamine Storage Tank #6 (ID No. ES-T52) – These tanks contain hexamine, which is a product of the Hexamine CMPU, a HON process. These tanks meet the definition of a storage vessel in 40 CFR 63.101 but do not meet the definition of Group 1 storage vessel under 40 CFR 63.111. Any storage vessel that does not meet the definition of a Group 1 storage vessel is defined as a Group 2 storage vessel. Per 40 CFR 63.119(a)(3), for each Group 2 storage vessel that is not part of an emissions average as described in 40 CFR 63.150, Acme must comply with the recordkeeping requirement in 40 CFR 63.123(a) but is not required to comply with any other provisions in 40 CFR 63.119 through 63.123.

The requested changes will be made under this permit modification.

[3] Judy Lee (12/18/2003).

Finally, the consultant and the permit engineer had detailed discussions and e-mails regarding the status of the hexamine rerun tank (ID No. ES-004-02.8-5) and hexamine distillation feed tank (ID No. ES-001-02.8-6). The rerun tank is currently permitted as a Group 1 process vent under the HON, while the distillation feed tank is not listed as being subject to the HON at all. The consultant clarified that these two tanks are considered surge control vessels as defined under 40 CFR 63.101. A surge control vessel means feed drums, recycle drums, and intermediate vessels. Surge control vessels are used within a chemical manufacturing process unit when in-process storage, mixing, or management of flow rates or volumes is needed to assist in production of a product. Descriptions of the tanks are provided below:

> The hexamine rerun tank (ID No. ES-004-02.8-5) contains condensate from the aqua ammonia vent collection system, rainwater, and products for re-run (water from distillation feed tank water). It's used for in process storage and mixing.
>
> The hexamine distillation feed tank (ID No. ES-001-02.8-6) receives bottoms water from the second effect of the distillation operation, which is referred to as crystallizer in the permit (ID Nos. ES-001-02.3 and ES-001-02.4). The feed tank supplies the water to the air stripper (ID No. ES-001-02f).

As specified in 40 CFR 63.100(e), 40 CFR 63 Subpart F and Subpart H apply to surge control vessels. These tanks will be added to Section 2.2.A of the permit, which lists requirements under 40 CFR 63 Subpart H, NESHAP for Organic Hazardous Air Pollutants for Equipment Leaks.

MACT Subpart FFFF

The special projects CMPU (ID No. ES-002-05) is an existing affected source under the MON, pursuant to 40 CFR 63, Subpart FFFF. With the exception of one resin wastewater stream, Acme has determined all affected sources at the facility are "Group 2" sources with limited or no requirements. For a thorough overview of the requirements under the MON, please refer to the permit review for Air Permit No. 01394/T39 issued to the facility on May 9, 2008.[4] This permit modification does not affect MON, and no changes to the permit are needed.

Case-by-Case MACT

The natural gas/No. 2/No. 5/No. 6 fuel oil-fired boiler (ID No. ES-001-01) is subject to the Case-by-Case MACT. Under the permit, Acme has to comply with work practice standards when firing No. 2 fuel oil and natural gas. The facility must meet emission limits and conduct stack testing when firing No. 5 or No. 6 fuel oil. According to the compliance report for an inspection performed on September 12, 2014, the facility is in compliance with the work practice requirements under the Case-by-Case MACT. Acme is not using No. 5 or No .6 fuel oil and has no plans to burn these fuels in the near future.[5]

The permit currently specifies the facility must comply with the Case-by-Case MACT requirements until May 22, 2019 and thereafter comply with "NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters," 40 CFR 63 Subpart DDDDD. These dates are incorrect. The facility must comply with the Case-by-Case MACT for boiler (ID No. ES-001-01) until May 19, 2010 and comply with 40 CFR 63 Subpart DDDDD

[4] Fern Paterson (05/09/2008).
[5] Mark Hedricks (09/12/2014)

beginning May 20, 2019. The permit will be updated to correct these dates under this modification.

Acme has accepted an avoidance condition for the Case-by-Case MACT for the natural gas/No. 2/ No. 5/ No. 6 fuel oil-fired back-up boiler (ID No. ES-001-01T). To avoid the Case-by-Case MACT, the back-up boiler cannot be retained on-site for a consecutive 180 days. This permit modification does not affect the avoidance condition, and no changes to the permit are needed.

PSD

Acme is a chemical processing facility with a major source threshold under the PSD permitting program of 100 tpy for all regulated NSR pollutants. The potential SO_2 emissions from the facility exceed the major source threshold. Acme accepted a facility wide-emissions limit on SO_2 of 100 tpy under Air Permit No. 01394T43 issued on June 5, 2012 to be an existing minor source under the PSD permitting program pursuant to 2D .0530. Prior to accepting this limit, the facility was considered major for PSD. As a result, the facility accepted 40 tpy limits on emissions of NO_x and SO_2 from the temporary boiler (ID No. ES-001-01T), when it was added to the permit. This permit modification does not affect the PSD status of the facility, and no changes to the PSD avoidance conditions are required under this permit modification.

112(r)

The facility is subject to Section 112(r) of the Clean Air Act requirements because it stores anhydrous ammonia, aqueous ammonia, and formaldehyde in quantities above the threshold quantities. The most recent compliance inspection for 112(r) was conducted on June 13, 2014 by Mark Hedrick of the Wilmington Regional Office (WiRO). Acme appeared to be in compliance with 112(r) at the time of inspection.

The permit does not currently include a specific permit condition for 112(r). A condition for 112(r) should be added to the permit at the next Tittle V permit renewal.

CAM

Acme is not subject to 40 CFR Part 64 CAM, and this permit modification does not affect the CAM status.

8. Facility Wide Air Toxics

Acme has previously submitted several facility-wide toxics demonstration for compliance with 2D .1100 and the modeled limits have been incorporated in the permit. As discussed in Section 5, modeled limits for all MACT sources, which are exempt from air toxics under 2Q .0702(a)(27), will be removed from the permit under this modification. The revised permit condition for 2D .1100 is provided in Attachment 2.

9. Facility Emissions Review

There is no change in Title V potential emissions under this permit modification. Actual emissions for 2009 through 2013 are reported in the header of this permit review. Acme has potential emissions of 12,411 metric tons of CO_2 equivalents,[6] as indicated in the permit application.

[6] CO_2 equivalent is defined as the sum of individual greenhouse gas pollutant emission times their global warming potential, converted to metric tons.

10. Compliance Status

The most recent compliance inspection was conducted on June 24, 2015, by Mark Hedrick of the WiRO. The facility appeared to be in compliance with all applicable requirements at that time. Additionally, a signed Title V Compliance Certification (Form E5) indicating the facility was in compliance with all applicable requirements was included with the permit application.

Acme has had the following compliance issues within the past five years:

- A Notice of Deficiency (NOD) was issued on October 5, 2012 for failure to record a monthly visual inspection of the free-flow hexamine bagging operation cartridge filter (ID No. CD-001-02e).
- A Notice of Violation (NOV) was issued on November 24, 2014 for the facility for allowing one hexamine reactor to bypass natural gas/LPG-fired the catalytic oxidizer (ID No. CD-001-02b).

All NOVs and NODs have been resolved.

11. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 2Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also pursuant to 2Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 2Q .0521 above. The state of South Carolina is within 50 miles of the facility and will be notified accordingly.

12. Other Regulatory Considerations

- A P.E. seal is NOT required for this application.
- A zoning consistency determination is NOT required for this application.
- A permit application fee of $904 is required and was submitted with the permit application.

13. Recommendations

The permit modification application for Hexion Inc. - Acme Operations located in Riegelwood, Columbus County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 01394T46.

Attachment 2

Revised Permit Condition for the HON, 40 CFR 63 Subpart G

1. 15A NCAC 2D .1111: MACT for 40 CFR 63, SUBPART G: HAZARDOUS ORGANIC NESHAP ("HON") for GROUP 1 PROCESS VENTS

a. For the formaldehyde CMPU **(ID No. ES-002-01)**, the Permittee shall comply with all applicable provisions, including the monitoring, recordkeeping, and reporting requirements contained in Environmental Management Commission Standard 15A NCAC 2D .1111, "Maximum Achievable Control Technology," (MACT) as promulgated in 40 CFR 63, Subparts A, F, G, and H.

Emission Standard [15A NCAC 2D .1111]

b. Pursuant to 40 CFR 63.113 the Permittee shall comply with the following requirements:
   i. HAP emissions from the formaldehyde CMPU **(ID No. ES-002-01)** shall be controlled by the catalytic oxidizer **(ID No. CD-002-01a)**.
   ii. HAP emissions from the formaldehyde CMPU **(ID No. ES-002-01)** controlled by the catalytic oxidizer **(ID No. CD-002-01a)** shall be reduced by at least 98% or to an exhaust concentration of 20 ppm, whichever is less stringent. [40 CFR 63.113(a)(2)]

Testing [15A NCAC 2Q .0508(f)]

c. The Permittee shall conduct performance tests as required by 40 CFR 63, Subpart G or as required in writing by DAQ. If emissions testing is required or otherwise performed by the Permittee for purposes of complying with 40 CFR 63 Subpart G, the testing shall be performed in accordance with 40 CFR 63.116, 40 CFR 63.7, and General Condition JJ. If the testing demonstrates the least stringent limit given in Section 2.1 B.1.b.ii above is exceeded, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111.

Operating Parameters

d. The Permittee shall maintain the daily average temperature of the vent stream immediately before the catalyst bed at or above 505°F. [40 CFR 63.114(c), 40 CFR 63.151(g)(5)]

Monitoring [15A NCAC 2Q .0508(f)]

e. An excursion shall be a failure to comply with the daily average temperature and/or insufficient monitoring data to determine compliance. Multiple failures occurring during the same daily averaging period shall count as one excursion. Monitoring data that is not collected is considered an excursion unless it is due to startup, shutdown, malfunction, or non-operation. The Permittee is allowed one excursion per semiannual reporting period. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 for each excursion beyond the allowed exception. [40 CFR 63.152(c)(2)(ii)(A), 40 CFR 63.152(c)(2)(ii)(C), 40 CFR 63.152(c)(2)(ii)(B)(6)]

f. The Permittee shall use temperature monitoring devices with continuous recorder(s) installed in the gas stream immediately before the catalyst bed. Monitoring equipment shall be installed, calibrated, maintained, and operated according to manufacturer's specifications or other written procedures that provide adequate assurance that the equipment would reasonably be expected to monitor accurately. The Permittee shall be in noncompliance if these requirements are not met. [40 CFR 63.114(a)(1)(ii), 40 CFR 63.114(c)]

g. The Permittee shall monitor the catalytic oxidizer **(ID No. CD-002-01a)** as follows:
   i. The Permittee shall conduct annual inspections of catalyst activity in accordance with a written plan. The plan shall be submitted to the DAQ regional office for approval and maintained on site. The plan shall specify the testing procedures used to determine the catalyst activity using a micro gas chromatograph.
   ii. The Permittee shall conduct an annual internal visual inspection of the catalyst bed to check for channeling, abrasion, and settling. If problems are found, the Permittee must take corrective action consistent with the manufacturer's recommendations and conduct a catalyst activity check within 30 days of completing corrective actions.

   [40 CFR 63.114(c)]

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the above requirements are not met or if a catalyst activity check shows an exceedance of the limit in Section 2.1 B.1.b.ii, except as provided in Section 2.1 B.1.e.

Recordkeeping [15A NCAC 2Q .0508(f), 40 CFR 63.118(a), 40 CFR 63.151(g) for Alternative Monitoring]

h. The Permittee shall continuously record temperature upstream of the catalyst bed and shall record the daily average value of the continuously monitored upstream temperature for each operating day (defined as midnight to midnight) in according with the following procedures [40 CFR 63.152(f)]:
   i. Daily averages shall consist of an average temperature for the operating day for the upstream temperature. If all recorded values during an operating day are within the operating range, a statement to this effect can be recorded instead of the daily average.
   ii. Records of the daily average temperature values for each operating day shall be determined according to the procedures specified below:
      (A) the monitoring system shall measure data values at least once every 15 minutes;
      (B) the Permittee shall record either:
         (1) each measured data value; or
         (2) block average values for 15-minute or shorter periods calculated from all measured data values during each period; or
         (3) at least one measured data value per minute if measured more frequently than once per minute.
      (C) If the daily average temperature for a given operating day is within the permitted limit, the Permittee shall retain either:
         (1) block hourly average values for that operating day for five years and discard the 15-minute or more frequent average values and readings at the end of the day; or
         (2) retain all the data for five years.
      (D) If the daily average temperature for a given operating day is outside the temperature limit, the Permittee shall retain the data recorded that operating day for five years.
      (E) Daily average temperature shall be calculated for each operating day, and retained for five years, unless all recorded values are within the limits or except as specified below in (F) and (G).
         (1) The daily average shall be calculated as the average of all values for a monitored temperature recorded during the operating day. The average shall cover a 24-hour period if operation is continuous, or the number of hours of operation per operating day if operation is not continuous.
         (2) The operating day shall be from midnight to midnight.
      (F) If all recorded values for a monitored temperature during an operating day are within the limit, the Permittee may record that all values were within the range and retain this record for five years rather than calculating and recording a daily average for that operating day. For these operating days, the records required in (C) above shall also be retained for 5 years.
      (G) Monitoring data recorded during periods specified in (1) through (6) below shall not be included in any calculated average. Records shall be kept of the times and durations of all such periods and any other periods during process or control device operation when monitors are not operating.
         (1) Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments;
         (2) Startups;
         (3) Shutdowns;
         (4) Malfunctions;
         (5) Performance Tests; and
         (6) Periods of non-operation of the chemical manufacturing process unit (or portion thereof), resulting in cessation of the emissions to which the monitoring applies.

   The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the above requirements are not met or if the daily average temperature shows an exceedance of the limit in Section 2.1 B.1.b.ii, except as provided in Section 2.1 B.1.e.

i. The Permittee shall maintain records of each annual internal inspection of the catalyst bed, the results of the annual catalyst activity checks, and any actions taken on the catalytic oxidizer. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the records are not maintained.

j. The Permittee shall maintain the following record for the lock and key or other similar device on each of

the oxidizer diversion stacks:

i. Records of the monthly visual inspections of the lock and key or similar devices maintained on each oxidizer diversion stack.
ii. Records of the duration of all periods that the key is checked out or emissions are otherwise diverted from the oxidizer.

[40 CFR 63.114(d), 40 CFR 63.118(a)]

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the records are not maintained.

k. The Permittee shall keep records up-to-date and readily accessible. [40 CFR 63.118(a)]
l. The Permittee shall also retain the following records and plans:
   i. Pursuant to 40 CFR 63.117, the Permittee shall maintain records of data from performance tests conducted for purposes of complying with 40 CFR 63 Subpart G including:
      (A) Parameter monitoring results averaged over the test period, and
      (B) Percent reduction of organic HAP or concentration.
   ii. Pursuant to 40 CFR 63.6(e)(3), the Permittee shall develop and implement a written startup, shutdown, and malfunction plan. As required by 40 CFR 63.10, records shall be maintained of times, dates, durations, causes, reasons, actions taken, and other pertinent information related to any startup, shutdown, or malfunction.
   iii. Pursuant to 40 CFR 63.6(e), at all times including periods of startup, shutdown, and malfunction, the Permittee shall operate and maintain the affected source and associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emission at least to the levels required by all relevant standards. As required by 40 CFR 63.10, records of all calibrations, checks, and maintenance activities shall be maintained and kept readily available.

   The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the required plans and records are not created and retained as required above.

Reporting [15A NCAC 2Q .0508(f)]

m. The Permittee shall submit a summary report of the observations postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified. The periodic report shall include the following:
   i. All daily average upstream temperatures that are less than the established operating temperature.
   ii. The results of the annual internal catalyst checks and any maintenance performed on the catalytic oxidizer.
   iii. The results of the annual catalyst activity check.
   iv. All operating days when insufficient monitoring data are collected.
   v. The duration of periods when monitoring data is not collected for each excursion. An excursion is any of the following cases:
      (A) When the daily average temperature value is less than permitted limit.
      (B) When the period of control device operation is four hours or greater in an operating day and monitoring data are insufficient to constitute a valid hour of data for at least 75 percent of the operating hours.
      (C) When the period of control device operation is less than 4 hours in an operating day and more than one of the hours during the period of operation does not constitute a valid hour of data due to insufficient monitoring data.
      (D) When insufficient catalyst activity is determined during the annual catalyst activity check.
   vi. All periods when the key is checked out or emissions are otherwise diverted from the oxidizer.
   vii. The results of any performance tests as required by 40 CFR 63.117.

   [40 CFR 63.118(f), 40 CFR 63.152(c)]
n. The Permittee shall submit semiannual startup, shutdown, and malfunction reports as required under 40 CFR 63.10(d)(5)(i) and immediate startup, shutdown, and malfunction reports as required under 40 CFR 63.10(d)(5)(ii).

Attachment 2
Revised 2D .1100 Permit Condition

STATE-ENFORCEABLE ONLY

3. 15A NCAC 2D .1100: CONTROL OF TOXIC AIR POLLUTANTS

a. Pursuant to 15A NCAC 2D .1100, "Control of Toxic Air Pollutants," and in accordance with the approved application for an air toxic compliance demonstration, the following permit limits shall not be exceeded:

i. Arsenic. Total arsenic emissions from boiler **(ID No. ES-001-01T)** shall not exceed 0.80 pounds per year.

ii. Beryllium. Total beryllium emissions from boiler **(ID No. ES-001-01T)** shall not exceed 0.28 pounds per year.

iii. Chromium VI equivalent. Total soluble chromate compound emissions from boiler **(ID No. ES-001-01T)**, measured as chromium VI equivalent, shall not exceed 4.13e-04 pounds per day.

iv. Nickel. Total soluble nickel emissions from boiler **(ID No. ES-001-01T)**, measured as nickel, shall not exceed 0.32 pounds per day

v. Ammonia and Formaldehyde. Ammonia and Formaldehyde emissions shall not exceed any rate listed in the following table:

Emissions Source	Allowable Emission Rate	
	Ammonia	**Formaldehyde**
Boiler **(ID No. ES-001-01T)**	0.14 lb/hr	8.23e-03 lb/hr
Cooling Tower No. 3 **(ID No. ES-003-03)**	0.37 lb/hr	0.09 lb/hr
Cooling Tower No. 5 **(ID No. ES-003-05)**	0.25 lb/hr	0.06 lb/hr
Cooling Tower No. 6 **(ID No. ES-003-06)**	0.25 lb/hr	0.06 lb/hr
Environmental Intermediate Tank #1 **(ID No. ES-T30)**		1.78e-04 lb/hr
Environmental Intermediate Tank #2 **(ID No. ES-T31)**		1.78e-04 lb/hr
Environmental Intermediate Tank #3 **(ID No. ES-T32)**		1.78e-04 lb/hr
Environmental Feed Tank #1 **(ID No. ES-T27)**		1.78e-04 lb/hr
Environmental Feed Tank #2 **(ID No. ES-T28)**		1.78e-04 lb/hr
Environmental Feed Tank #3 **(ID No. ES-T29)**		1.78e-04 lb/hr
Wastewater tank for the hexamine CMPU **(ID No. ES-007.7)**		1.78e-04 lb/hr
Wastewater tank for the hexamine CMPU **(ID No. ES-007.8)**		1.78e-04 lb/hr
Wastewater tank for the hexamine CMPU **(ID No. ES-007.9)**		1.78e-04 lb/hr
Wastewater tanks for the hexamine CMPU **(ID No. ES-007.10)**		1.78e-04 lb/hr
Green Overheads Wastewater Tank **(ID No. ES-T53)**	0.03 lb/hr	4.42e-05 lb/hr
Wastewater Treatment Plant **(ID No. ES-POTW)**, including:		
• Biotreatment Area 2	4.22e-04 lb/hr	3.44e-04 lb/hr
• Pre-Equalization Tank	0.01 lb/hr	5.83e-03 lb/hr
• Biotreatment Area 1	4.22e-04 lb/hr	3.44e-04 lb/hr
• Post-Equalization Tank	3.56e-05 lb/hr	2.79e-05 lb/hr
• Digester,	3.02e-06 lb/hr	1.60e-06 lb/hr
• Sand filter	2.25e-06 lb/hr	1.75e-06 lb/hr
Lined Pond at the POTW **(ID No. ES-005)**	6.75e-3b/hr	2.51-03 b/hr
Aqua Ammonia Unloading Operation **(ID No. ES-NH3)**, including:		
• Area 1	0.67 lb/hr	
• Area 2	0.67 lb/hr	

Recordkeeping

b. To comply with the TAP emissions limitations in Section 2.2.B.3.a. above, the Permittee may only fire one boiler **(ID No. ES-001-01 or ID No. ES-001-01T)** any given time.

c. The Permittee shall retain records of TAP emissions from each of the affected sources as listed above. The record shall include calculations and supporting data. Required records of emission rates and emissions calculations shall be maintained in a logbook. The logbook (in written or electronic form) shall be kept on-site and made available to DAQ personnel upon request.